

REMARKS

The following comments and the accompanying Declaration Under 37 CFR 1.132 are provided to supplement the remarks made in the June 30, 2005 Amendment. In that Amendment, Applicants point out that the calcium fluoride crystals produced according to the prior art cannot achieve a straight barrel part diameter of at least 17 cm, a straight barrel length of 8 cm and a maximum birefringence of 3 nm/cm. Contrary to the assertions in the March 30, 2005 Office Action that it would be obvious to optimize the process conditions of the prior art in order to produce a calcium fluoride crystal obtained by a pulling method, not all single crystal pulling techniques can result in a crystal as claimed in the present application.

This is demonstrated in the data provided in the present application that is summarized in the following chart:

	Length (cm)	Birefringence (nm/cm)	Pull Rate (mm/hr)	Ceiling Board	Conductivity (W/m².K)	Lid
Ex. 1	10	1.375	2	Yes	5,000	Yes
Ex. 2	8	0.89	2	Yes	20,000	Yes
Ex. 3	9	2.652	2	Yes	5,000	No
Ex. 4	10	0.892	3	Yes	5,000	Yes
CE1	6	3.870	2	No	n/a	Yes
CE2	6	4.628	2	Yes	15	Yes
CE3	4	2.347	2	No	n/a	Yes
CE4	6	5.703	10	Yes	5,000	Yes

This data indicates that a high conductivity ceiling board (at least 5,000 W/m²K) and a lower pull rate (2-3 mm/hr) can result in the desired combination of at least 8 cm straight barrel part length and maximum birefringence of 3 nm/cm. Examples 1-4 meet the limitations of claim 1 and were produced according to a crystal pulling method that resulted in these properties. However, comparative examples 1-4 fail to produce an as-grown single crystal of calcium fluoride having a straight barrel length of 8 cm or more when there was no ceiling board (CE1 and CE3), the conductivity of the ceiling board was low (CE2) or the pulling rate was too high (CE4).

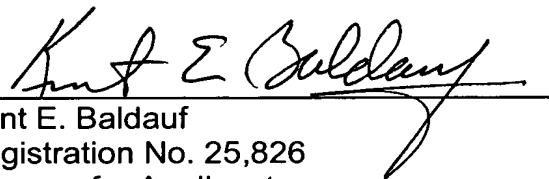
The accompanying Declaration Under 37 CFR 1.132 reports experiments repeating comparative Example 1, except that the pull time was extended to obtain as-grown single crystals of calcium fluoride having straight barrel part lengths of 7 cm and 8 cm. In both instances, the birefringence of the crystals was excessive. Thus, even though a crystal of calcium fluoride can be pulled by a single crystal pulling method to have a straight barrel part length of 8 cm or more, it is not an obvious optimization of a process condition to produce a maximum birefringence of 3 nm/cm.

Accordingly, claims 1, 2 and 4-7 directed to an as-grown single crystal of calcium fluoride obtained by a single crystal pulling method and having a straight barrel length of at least 8 cm and birefringence of 3nm/cm or less defines over the prior art of record. Allowance of claims 1, 2 and 4-7 is respectfully requested.

Respectfully submitted,

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By



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